University of California
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SEASONAL LABOR NEEDS FOR CALIFORNIA CROPS

SONOMA COUNTY

Progress Report No. 49

by

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Preliminary -- Subject to Correction

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(Farm Labor Survey -- July-December, 1936)

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Sonoma County

Scope of Presentation.-- The following considerations govern the presentation of this progress report:

1. The data are confined to the area indicated above.

2. The data are confined solely to crops, livestock needs being ignored.

3. The findings apply only to occasional or seasonal labor requirements as distinguished from labor contributed by farm operators and by workers employed on a year-round or regular basis of employment.

4. Attention is concentrated upon workers required for hand tasks -- planting, thinning, weeding, hoeing, and harvesting -- without including teamsters, tractor drivers, irrigators, and shed packers of vegetables or fruits.

5. The presentation includes the so-called migratory, transient, or roving workers which comprise an important source of help needed in connection with certain tasks and at "peak" times which seasonally arise in connection with many field, truck, and fruit crops commercially produced in California.

6. This report is confined to California's need for seasonal agricultural workers because of the more pressing problems liable to arise in connection therewith. A later study is planned which will deal with other kinds of labor involved in the production of California's many crops.

Brief Description of the Area.-- Sonoma County lies just north of San Pablo Bay with its southern tip bordering the bay. It extends north to Mendocino County and west to the Pacific Ocean, the coastal range of mountains surrounding the area. The Russian River enters Sonoma County at the northern boundary through a narrow gorge flanked by rough, mountainous territory. Approximately a mile south of the northern boundary this gorge widens into a fertile valley about 1 to 1 1/2 miles in width. This extends for about 13 miles in a southeasterly direction and then expands into Alexander Valley, which is 7 miles long and has a maximum width of 3 1/2 miles. Paralleling this on the west is Dry Creek Valley, which is about 2 miles wide and 12 miles in length. South of these two valleys a broad level plain stretches southeastward to Santa Rosa, sloping down to sea level at Petaluma. West of this area is Sebastopol, a district of low, rounded hills, devoted mainly to apple growing. The important soils are recent alluvial fillings of the Yolo series. The county has a total land area of 1,012,480 acres, three fourths of which is arable.

The northern part of the farming district is an extension of the hop growing area found in Mendocino County. Sonoma County is devoted chiefly to intensive truck farming, deciduous fruits, and grapes, the latter being most important from the standpoint of capital invested.

Crops, Acreage, and Production.-- The bases used in calculating occasional or seasonal need for labor in addition to that furnished by farm operators and regularly employed workers appears as table 1.

TABLE 1

Basis for Calculating Seasonal Labor Requirements
Sonoma County

Crops	Acreage	Production
Field crops:*		
Alfalfa †	1,042	3,407 tons
Corn (for grain) †	558	15,274 bushels (on 165 farms)
(for other purposes)	1,005	--
Grain -- wheat	1,751	26,205 bushels
barley	879	27,667 bushels
oats	14,021	434,393 bushels
Hay -- grain hay	34,989	60,386 tons
other grasses	11,222	16,664 tons
annual legumes	361	657 tons
Hops	2,500	15,010 bales of 200 pounds (dry ‡ (weight
Potatoes -- Irish	1,783	86,300 cwt.
Sorghums (for hay and silage)	416	3,407 tons
Vegetable crops:		
Cucumbers †	74	--
Tomatoes	417	2,919 tons
Seed crops:		
Beet seed	1,000)	875 tons
Carrot seed	300)	
Lettuce seed	900)	
Radish seed	800)	
Fruit and nut crops:		
Apricots †	30	25 tons
Apples	13,460	28,126 tons sold fresh 4,700 tons dry weight) dried ‡ Gravenstein ‡) 4,300 tons dry weight --) late varieties
Cherries -- mostly canned	1,500	1,387 tons
Figs ‡	30	--
Grapes	21,500	35,000 tons
Olives †	38	--
Peaches -- cling and free †	175	180 tons
Pears -- 99 per cent Bartlett	3,500	6,845 tons -- 40 per cent dried ‡
Plums †	477	329 tons -- canning varieties
Prunes	23,000	23,000 tons dry weight ‡
Walnuts	930	205 tons -- 419,900 pounds merchantable
Bushberries	100	140 tons
Strawberries † ϕ	40	--

* Data from 1935 Census, except hops.

† Use of seasonal labor on these crops inconsequential and hence ignored.

‡ Drying ratios used in this report are:

Apples	7.5 to 1
Pears	5.5 to 1
Prunes	2.25 to 1
Hops	4 to 1

§ Data from Federal State Crop Reporting Service. Acreage of specified vegetable crops by counties. 1935.

Operations Requiring Seasonal Labor and Time of Need.-- Farm operations requiring the use of seasonal or occasional labor for the various crops raised in Sonoma County are indicated in table 2. This tabulation does not include the employing of shed workers needed to wash, pack, and prepare various commodities for shipping and marketing.

TABLE 2

Operations Requiring the Use of Seasonal Labor and Time of Need by Crops
Sonoma County

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Field crops:				
Grain -- wheat, barley, and oats	Binding	June -- 60 per cent of acreage July -- 40 per cent of acreage	50	10 acres
	Shocking bundles	June -- 50 per cent of acreage July -- 50 per cent of acreage	100	5 acres
	Threshing	July -- 50 per cent of crop August -- 50 per cent of crop	75	2 acres
Hay -- other than alfalfa	Mowing	April 25-30 -- 5 per cent of acreage	75	10 acres*
	Raking	May 1-31 -- 75 per cent of acreage		20 acres
	Shocking	June 1-15 -- 20 per cent of acreage		40 acres
	Trimming shocks	May -- 75 per cent of crop June -- 25 per cent of crop	100	10 tons
	Baling -- 50 per cent of crop	June 1-30 -- 30 per cent of job July 1-31 -- 30 per cent of job	100	8 tons (in 13hour day)

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Table 2 continued.

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Hay (cont.)	Baling (cont.)	August 1-31 -- 25 per cent of job September 1-30 -- 15 per cent of job		
Hops	Pruning, stringing, and training	March 20-31 -- 1 man-day per acre April 1-30 -- 4 man-days per acre May 1-31 -- 4 man-days per acre June 1-30 -- 4 man-days per acre July 1-15 -- 2 man-days per acre	100	Total of 15 man-days per acre †
	Picking	August 15-31 -- 50 per cent of crop September 1-12 -- 50 per cent of crop	100	250 pounds (green weight)
	Drying	August 15-31 -- 50 per cent of crop September 1-12 -- 50 per cent of crop	100	4,000 pounds (green weight),
	Baling	September 10-30 -- all of crop	66	12 bales (of 190 pounds dried weight)
Potatoes -- Irish	Cutting seed -- 8 cwt. per acre	May 1-31 -- 50 per cent of job June 1-30 -- 50 per cent of job	25	800 pounds
	Hoeing -- 1 time	June -- 1/3 of job July -- 1/3 of job August -- 1/3 of job	75	2.5 acres
	Digging by hand -- 75 per cent of crop	September 25-30 -- 10 per cent of job October 1-31 -- 60 per cent of job November 1-15 -- 30 per cent of job	90	15 cwt.
	Picking up after machine digger -- 25 per cent of crop	September 25-30 -- 10 per cent of job October 1-31 -- 60 per cent of job November 1-15 -- 30 per cent of job	90	40 cwt.
Tomatoes	Planting in field	May 1-15 -- all of acreage	100	0.75 acre

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Table 2 continued.

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Tomatoes (cont.)	Picking	September 10-30 -- 50 per cent of crop October 1-20 -- 50 per cent of crop	100	2,500 pounds
Seed crops:				
Beet seed	Planting	December -- 50 per cent of acreage January -- 50 per cent of acreage	100	0.75 acre
	Hoeing -- 2 times	February -- 2/3 of acreage March -- 2/3 of acreage April -- 2/3 of acreage	100	0.75 acre
	Cutting by hand	July 15-31 -- 50 per cent of acreage August 1-15 -- 50 per cent of acreage	100	0.5 acre
	Threshing	August 15-31 -- 80 per cent of acreage September 1-7 -- 20 per cent of acreage	80	1.8 acres
Carrot seed	Planting roots	December -- 50 per cent of acreage January -- 50 per cent of acreage	100	0.5 acre
	Hoeing -- 2 times	February -- 2/3 of acreage March -- 2/3 of acreage April -- 2/3 of acreage	100	0.75 acre
	Cutting by hand	August 20-31 -- 20 per cent of acreage September 1-30 -- 60 per cent of acreage October 1-10 -- 20 per cent of acreage	100	0.4 acre
	Threshing	September 1-30 -- 60 per cent of acreage October 1-20 -- 40 per cent of acreage	80	0.33 acre
Lettuce seed	Thinning	April 1-30 -- 2/3 of acreage May 1-15 -- 1/3 of acreage	100	0.5 acre
	Hoeing	June	100	0.5 acre
	Cutting by hand	August -- 75 per cent of acreage September -- 25 per cent of acreage	100	0.33 acre

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Table 2 continued.

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Lettuce seed (cont.)	Threshing by rolling, rough screening and sacking	August -- 70 per cent of acreage September -- 30 per cent of acreage	80	0.5 acre
Radish seed	Thinning	March -- 50 per cent of acreage April -- 50 per cent of acreage	100	0.5 acre
	Hoeing	May	100	0.66 acre
	Cutting and piling	July 15-31 -- 50 per cent of acreage August 1-15 -- 50 per cent of acreage	100	0.5 acre
	Threshing	July 24-31 -- 30 per cent of crop August 1-20 -- 70 per cent of crop	75	1 acre
Fruit and nut crops				
Apples	Pruning	December 1-31 -- 1/3 of acreage January 1-31 -- 1/3 of acreage February 1-28 -- 1/3 of acreage	60	0.25 acre
	Brush burning	December 1-31 -- 1/3 of acreage January 1-31 -- 1/3 of acreage February 1-28 -- 1/3 of acreage	75	1 acre
	Spraying -- 5 times	December -- 1/3 of acreage January -- 1/3 of acreage February -- 1/3 of acreage April -- 1 time May -- 150 per cent of acreage June -- 150 per cent of acreage	66	2.0 acres
	Thinning -- 50 per cent of acreage	May 20-31 -- 50 per cent of job June 1-10 -- 50 per cent of job	90	(varies greatly) average about 1/3 acre
	Picking for fresh shipment	July 15-31 -- 28 per cent of shipment August 1-31 -- 64 per cent of shipment	100	2,000 pounds

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Table 2 continued.

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Apples (cont.)	Picking for fresh shipment	September 1-30 -- 7.0 per cent of shipment October 1-31 -- 1.0 per cent of shipment		
	Picking up for drying and by-products	July 15-31 -- 15 per cent of tonnage August 1-31 -- 30 per cent of tonnage September 1-30 -- 30 per cent of tonnage October 1-31 -- 20 per cent of tonnage November 1-15 -- 5 per cent of tonnage	100	2,800 pounds
	Drying	July 15-31 -- 15 per cent of tonnage August 1-31 -- 30 per cent of tonnage September 1-30 -- 30 per cent of tonnage October 1-31 -- 20 per cent of tonnage November 1-15 -- 5 per cent of tonnage	100	13 man-days per dry ton = 154 pounds -- dry weight
Cherries	Picking	May 20-31 -- on early season only June 1-15 -- all of crop	100	200 pounds
Grapes	Pruning	January 1-31 -- 30 per cent of acreage February 1-28 -- 50 per cent of acreage March 1-31 -- 20 per cent of acreage	50	0.75 acre
	Brush burning	January 1-31 -- 30 per cent of acreage February 1-28 -- 50 per cent of acreage March 1-31 -- 20 per cent of acreage	50	5.0 acres
	Picking for wineries	September 1-30 -- 75 per cent of crop October 1-31 -- 25 per cent of crop	100	2,400 pounds
Pears	Pruning	December 1-31 -- 30 per cent of acreage January 1-31 -- 30 per cent of acreage February 1-28 -- 30 per cent of acreage March 1-15 -- 10 per cent of acreage	50	0.2 acre

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Table 2 continued.

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Pears	Brush burning	December 1-31 -- 25 per cent of acreage January 1-31 -- 25 per cent of acreage February 1-28 -- 25 per cent of acreage March 1-15 -- 25 per cent of acreage	75	3.0 acres
	Spraying -- largely by regular employees			
	Picking	August 10-31 -- 2/3 of crop September 1-10 -- 1/3 of crop	100	1,600 pounds
	Cutting for drying	August 15-31 -- 50 per cent of job September 1-20 -- 50 per cent of job	100	1,000 pounds
	Other labor in dry-yards	August 15-31 -- 33 per cent of job September 1-30 -- 66 per cent of job	100	26.5 hours[‡] per fresh ton
Prunes	Pruning -- 30 per cent of acreage	December 1-31 -- 30 per cent of job January 1-31 -- 30 per cent of job February 1-28 -- 30 per cent of job March 1-15 -- 10 per cent of job	25	0.25 acre
	Brush burning -- 30 per cent of acreage	December -- 25 per cent of job January -- 25 per cent of job February -- 25 per cent of job March -- 25 per cent of job	25	2.5 acres
	Picking up	August 15-31 -- 25 per cent of crop September 1-30 -- 75 per cent of crop	100	1,500 pounds
	Dipping and drying -- 50 per cent by sun	August 15-31 -- 20 per cent of job September 1-30 -- 70 per cent of job October 1-15 -- 10 per cent of job	66	8.3 hours[‡] per fresh ton
	50 per cent by dehydrators	August 15-31 -- 25 per cent of job September 1-30 -- 75 per cent of job	66	6 hours per fresh ton

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Table 2 continued.

Crop	Operation	Time of need by months	Per cent of work done by seasonal help	Output per man-day
Walnuts	Knocking or shaking off	October 1-31 -- 75 per cent of crop November 1-15 -- 25 per cent of crop	100	300 pounds
	Picking up and hulling by hand	October 1-31 -- 75 per cent of crop November 1-15 -- 25 per cent of crop	100	200 pounds
Bushberries -- mostly blackberries	Picking	May 28-31 -- 5 per cent of crop June 1-30 -- 50 per cent of crop July 1-31 -- 35 per cent of crop August 1-31 -- 10 per cent of crop	90	150 pounds

*Power mowers, with capacity of 20 acres per day, estimated to be used on 25 per cent of acreage or more.

† Hop pruning, stringing, and training are generally done on contract, and require 1 person for each 5 to 7 acres continuously from about March 20 to July 15.

‡ From Christie, A. W. and L. C. Barnard. The principles and practice of sun-drying fruit. California Agr. Exp. Sta. Bul. 388. 1925.

Findings of Seasonal Labor Needs.-- Details and summaries of seasonal labor requirements of Sonoma County agriculture are presented as table 3. The "size of task" are figures drawn from table 1, in terms of either acreage or output in tons, crates, boxes, or whatever unit is commonly used. The "output per man-day" is an average figure for the entire acreage or output figured in crates, hampers, boxes, or other units as indicated in the table. If the work is of a nature that requires a crew, different members of which perform different tasks, then the average shown is per man based on the entire crew. Length of day is 9 hours, November to February; 10 hours March to October, unless otherwise stated. Wide variations in output occur between farm and farm, field and field, and season and season, because of differences in soil types, climatic conditions, weeds, yields, and other factors influencing the amount of work that a laborer can perform in a given day. Moreover, the basis of output is a mature, experienced male worker without reference to use of women, children, and more or less inexperienced help that is sometimes used in connection with certain of the tasks requiring use of seasonal workers. The column headed "available days" reflects (a) limitations set from the period within which the work must be performed because of the nature of the task, such as transplanting, thinning, weeding, and cutting, and (b) available days as determined by weather conditions, inclement weather reducing the number of days when a required task can be performed. The "required number of individuals" is given in terms of workers as noted above in connection with "output per man-day."

It is probable that the estimated number of workers required, as recorded in table 3, will often be too low, for the reason that "peaks" frequently occur during which an unusually large proportion of the job is done in a very short period. This would naturally require a much greater number of workers than when the work is spread over a longer period, even though the total amount of labor (in man-days) remains the same.

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TABLE 3

Seasonal Labor Needs -- Sonoma County -- by Months and Tasks

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number or workers*
January	Beets (for seed): Planting	500 acres	0.75 acre	667	15	45
	Carrots (for seed): Planting roots	400 acres	0.5 acre	800	15	54
	Radishes (for seed): Thinning	800 acres	1.5 acres	534	15	36
	Apples: Pruning	2,692 acres†	0.25 acre	10,768	15	718
	Brush burning	3,365 acres†	1.00 acre	3,365	15	225
	Spraying	2,991 acres†	2.00 acres	1,496	15	100
	Grapes: Pruning	3,225 acres†	0.75 acre	4,300	15	287
	Brush burning	3,225 acres†	5.0 acres	645	15	43
	Pears: Pruning	525 acres†	0.2 acre	2,625	15	175
	Brush burning	656 acres†	3.00 acres	219	15	15
	Prunes: Pruning	518 acres†	0.25 acre	2,072	15	139
	Brush burning	431 acres†	2.5 acres	173	15	12
	Totals			27,664	15	1,845 man-months
February	Beets (for seed): Hoeing	666 acres	0.75 acre	888	18	50
	Carrots (for seed): Hoeing	534 acres	0.75 acre	712	18	40
	Radishes (for seed): Hoeing	800 acres	1.75 acres	458	18	26
	Apples: Pruning	2,692 acres†	0.25 acre	10,768	18	599
	Brush burning	3,365 acres†	1.0 acre	3,365	18	187
	Spraying	2,991 acres†	2.0 acres	1,496	18	84
	Grapes: Pruning	5,375 acres†	0.75 acre	7,167	18	399
	Brush burning	5,375 acres†	5.0 acres	1,075	18	60
	Pears: Pruning	525 acres†	0.2 acre	2,625	18	146
	Brush burning	656 acres†	3.0 acres	219	18	13
	Prunes: Pruning	518 acres†	0.25 acre	2,072	18	116
	Brush burning	432 acres†	2.5 acres	173	18	10
	Totals			31,018	18	1,724 man-months
March	Hops: Pruning, stringing, and training	2,500 acres	1.0 acre	2,500	7	358 (Mar. 20-31)
	Beets (for seed): Hoeing	667 acres	0.75 acre	890	21	43
	Carrots (for seed): Hoeing	533 acres	0.75 acre	711	21	34

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Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
March (cont.)	Grapes: Pruning	2,150 acres†	0.75 acre	2,867	21	137
	Brush burning	2,150 acres†	5.0 acres	430	21	21
	Pears: Pruning	1,75 acres†	0.2 acre	875	10	88 (Mar. 1-15)
	Brush burning	657 acres†	3.0 acres	219	10	22 (Mar. 1-15)
	Prunes: Pruning	172 acres†	0.25 acre	688	10	69 (Mar. 1-15)
	Brush burning	431 acres†	2.5 acres	173	21	9
	Totals			9,353	21	446 man-months
April	Hay (other than alfalfa): Mowing	1,747 acres†	10.0 acres	175	21	9
	Raking	1,747 acres†	20.0 acres	88	21	5
	Shocking	1,747 acres†	40.0 acres	44	21	3
	Hops: Pruning, stringing, and training	2,500 acres	0.25 acre	10,000	21	477
	Beets (for seed): Hoeing	667 acres	0.75 acre	890	21	43
	Carrots (for seed): Hoeing	534 acres	0.75 acre	712	21	34
	Lettuce (for seed): Thinning	600 acres	0.5 acre	1,200	21	58
	Apples: Spraying	8,974 acres†	2.0 acres	4,487	21	214
	Totals			17,596	21	838 man-months
May	Hay (other than alfalfa): Mowing	26,197 acres†	10.0 acres	2,620	22	120
	Raking	26,197 acres†	20.0 acres	1,310	22	60
	Shocking	26,197 acres†	40.0 acres	655	22	30
	Trimming shocks	58,280 tons	10.0 tons	5,828	22	265
	Hops: Pruning, stringing, and training	2,500 acres	0.25 acre	10,000	22	455
	Potatoes (Irish): Cutting seed	1,783 cwt.†	800.0 pounds	223	22	11
	Tomatoes: Planting for field	417 acres	0.75 acre	556	11	51 (May 1-15)
	Lettuce (for seed): Thinning	300 acres	0.5 acre	600	11	55 (May 1-15)
	Apples: Spraying	13,460 acres†	2.0 acres	6,730	22	306
	Thinning	3,028 acres†	0.33 acre	9,176	8	1,147 (May 20-31)
	Bushberries: Picking	6 tons †	150.0 pounds	80	4	20 (May 28-31)
	Totals			37,778	22	1,718 man-months
June	Grain: Binding	4,995 acres†	10.0 acres	500	25	20
	Shocking	8,325 acres	5.0 acres	1,665	25	67
	Hay (other than alfalfa): Mowing	6,985 acres†	10.0 acres	699	25	28
	Raking	6,985 acres†	20.0 acres	350	25	14
	Shocking	6,985 acres†	40.0 acres	175	25	7
	Trimming shocks	19,427 tons	10.0 tons	1,943	25	78
	Baling	11,656 tons†	8.0 tons	1,457	25	59

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Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
June (cont.)	Hops: Pruning, stringing, and training	2,500 acres	0.25 acre	10,000	25	400
	Potatoes (Irish): Cutting seed	1,783 cwt.†	800.0 pounds	223	25	9
	Hoeing	446 acres †	2.5 acres	179	25	8
	Lettuce (for seed): Hoeing	900 acres	0.5 acre	1,800	25	72
	Apples: Spraying	13,460 acres†	2.0 acres	6,730	25	270
	Thinning	3,028 acres †	0.33 acre	9,176	8	1,147 (June 1-10)
	Cherries: Picking	1,387 tons	200.0 pounds	13,870	12	1,156 (June 1-15)
	Bushberries: Picking	63 tons †	150.0 pounds	840	25	34
	Totals			49,607	25	1,985 man-months
July	Grain: Binding	3,330 acres †	10.0 acres	333	26	13
	Shocking	8,326 acres	5.0 acres	1,666	26	65
	Threshing	6,244 acres †	2.0 acres	3,122	26	121
	Hay (other than alfalfa): Baling	11,656 tons †	8.0 tons	1,457	26	57
	Hops: Pruning, stringing, and training	2,500 acres	0.5 acre	5,000	13	385 (July 1-15)
	Potatoes (Irish): Hoeing	446 acres †	2.5 acres	179	26	7
	Beets (for seed): Cutting by hand	500 acres	0.5 acre	1,000	13	77 (July 15-31)
	Radishes (for seed): Cutting and piling	400 acres	0.75 acre	534	13	42 (July 15-31)
	Threshing	180 acres †	1.0 acre	180	6	30 (July 24-31)
	Apples: Picking for shipment	7,875 tons ’	1.0 ton	7,875	13	606 (July 15-31)
	Picking up for drying and by-products	10,125 tons ‡	2,800.0 pounds	7,233	13	557 (July 15-31)
	Drying	1,350 tons	§	17,550	13	1,350 (July 15-31)
	Bushberries: Picking	44 tons †	150.0 pounds	587	26	23
	Totals			46,716	26	1,797 man-months
August	Grain: Threshing	6,244 acres †	2.0 acres	3,122	26	121
	Hay (other than alfalfa): Baling	9,714 tons †	8.0 tons	1,215	26	47
	Hops: Picking	5,703,800 pounds ¶	250.0 pounds	22,816	13	1,756 (Aug. 15-31)
	Drying	5,703.800 pounds ¶	2.0 tons	1,426	13	110 (Aug. 15-31)

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Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
August (cont.)	Potatoes (Irish): Hoeing	446 acres†	2.5 acres	179	26	7
	Beets (for seed): Cutting by head	500 acres	0.5 acre	1,000	13	77 (Aug. 1-15)
	Threshing	640 acres †	1.8 acres	356	13	28 (Aug. 15-31)
	Carrots (for seed): Cutting by hand	160 acres	0.4 acre	400	9	45 (Aug. 20-30)
	Lettuce (for seed): Cutting by hand	675 acres	0.33 acre	2,046	26	79
	Threshing, rough screening, and sacking	504 acres †	0.5 acre	1,008	26	39
	Radishes (for seed): Cutting and piling	400 acres	0.75 acre	534	13	42 (Aug. 1-15)
	Threshing	420 acres†	1.0 acre	420	17	25 (Aug. 1-20)
	Apples: Picking for shipment	18,000 tons	1.0 ton	18,000	26	693
	Picking up for drying and by-products	20,250 tons‡	2,800.0 pounds	14,465	26	557
	Drying	2,700 tons	§	35,100	26	1,350
	Pears: Picking	4,564 tons	1,600.0 pounds	5,705	17	336 (Aug. 10-31)
	Cutting for drying	1,369 tons	1,000.0 pounds	2,738	13	211 (Aug. 15-31)
	Other dry-yard labor	913 tons	§	2,468	13	190 (Aug. 15-31)
	Prunes: Picking up	12,937 tons	1,500.0 pounds	17,250	13	1,327 (Aug. 15-31)
	Dipping and drying (by sun)	3,415 tons †	§	2,846	13	218 (Aug. 15-31)
	Dipping and drying (by dehydrator)	4,269 tons †	§	2,572	13	199 (Aug. 15-31)
	Bushberries: Picking	13 tons †	150.0 pounds	174	26	7
	Totals			135,840	26	5,225 man-months
September	Hay (other than alfalfa): Baling	5,828 tons†	8.0 tons	729	26	29
	Hops: Picking	5,703,800 pounds ¶	250.0 pounds	22,816	10	2,282 (Sept. 1-12)
	Drying	5,703.800 pounds ¶	2.0 tons	1,426	10	143 (Sept. 1-12)
	Baling ‖	9,907 bales†	12.0 bales	826	17	49 (Sept. 10-30)
	Potatoes (Irish): Digging by hand	5,825 cwt.†	15.0 cwt.	389	5	78 (Sept. 25-30)
	Picking up after machine digger	1,942 cwt.†	40.0 cwt	49	5	10 (Sept. 25-30)

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
September (cont.)	Tomatoes: Picking	1,459 tons	2,500 pounds	1,168	17	69 (Sept. 10-30)
	Beets (for seed): Threshing	160 acres†	1.8 acres	89	6	15 (Sept. 1-7)
	Carrots (for seed): Cutting by hand	480 acres	0.4 acre	1,200	26	47
	Threshing	384 acres†	0.33 acre	1,164	26	45
	Lettuce (for seed): Cutting by hand	225 acres	0.33 acre	682	26	27
	Threshing, rough screening, and sacking	216 acres†	0.5 acre	432	26	17
	Apples: Picking for shipment	1,969 tons	1.0 ton	1,969	26	76
	Picking up for drying and by-products	20,250 tons‡	2,800.0 pounds	14,465	26	557
	Drying	2,700 tons	§	35,100	26	1,350
	Grapes: Picking for wineries	26,250 tons	2,400.0 pounds	21,875	26	842
	Pears: Picking	2,281 tons	1,600.0 pounds	3,042	17	179 (Sept. 1-20)
	Cutting for drying	1,369 tons	1,000.0 pounds	2,738	17	162 (Sept. 1-20)
	Other dry-yard labor	1,825 tons	§	4,933	26	190
	Prunes: Picking up	38,813 tons	1,500.0 pounds	51,751	26	1,991
	Dipping and drying (by sun)	11,954 tons†	§	9,962	26	384
	Dipping and drying (by dehydrator)	12,809 tons†	§	7,717	26	297
	Totals			184,522	26	7,097 man-months
October	Potatoes (Irish): Digging by hand	34,951 cwt.†	15.0 cwt.	2,331	23	102
	Picking up after machine digger	11,651 cwt.†	40.0 cwt.	292	23	13
	Tomatoes: Picking	1,469 tons	2,500.0 pounds	1,176	15	79 (Oct. 1-15)
	Carrots (for seed): Cutting by hand	160 acres	0.4 acre	400	8	50 (Oct. 1-10)
	Threshing	256 acres†	0.33 acre	776	15	52 (Oct. 1-20)
	Apples: Picking for shipment	282 tons	1.0 ton	282	23	13
	Picking up for drying and by-products	13,500 tons‡	2,800.0 pounds	9,643	23	420
	Drying	1,800 tons	§	23,400	23	1,018
	Grapes: Picking for wineries	8,750 tons	2,400 pounds	7,292	23	318
	Prunes: Dipping and drying (by sun)	1,708 tons†	§	1,424	12	119 (Oct. 1-15)

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
October (cont.)	Walnuts: Knocking or shaking off	153 tons	300.0 pounds	1,020	23	45
	Picking up and hulling by hand	153 tons	200.0 pounds	1,530	23	67
	Totals			49,566	23	2,156 man-months
November	Potatoes (Irish): Digging by hand	17,476 cwt.†	15.0 cwt	1,166	11	106 (Nov. 1-15)
	Picking up after machine digger	5,825 cwt.†	40.0 cwt.	146	11	14 (Nov. 1-15)
	Apples: Picking up for drying and by-products	3,375 tons‡	2,800.0 pounds	2,411	11	220 (Nov. 1-15)
	Drying	450 tons	§	5,850	11	532 (Nov. 1-15)
	Walnuts: Knocking or shaking off	52 tons	300.0 pounds	347	11	32 (Nov. 1-15)
	Picking up and hulling by hand	52 tons	200.0 pounds	520	11	48 (Nov. 1-15)
	Totals			10,440	21	498 man-months
December	Beets (for seed): Planting	500 acres	0.75 acre	667	15	45
	Carrots (for seed): Planting roots	400 acres	0.5 acre	800	15	54
	Apples: Pruning	2,692 acres†	0.25 acre	10,768	15	718
	Brush burning	3,365 acres†	1.00 acre	3,365	15	225
	Spraying	2,991 acres†	2.00 acres	1,496	15	100
	Pears: Pruning	525 acres†	0.2 acre	2,625	15	175
	Brush burning	656 acres†	3.0 acres	219	15	15
	Prunes: Pruning	517 acres†	0.25 acre	2,068	15	138
	Brush burning	431 acres†	2.5 acres	173	15	12
	Totals			22,181	15	1,479 man-months

*On a monthly basis unless otherwise noted.

† Portion of task performed by seasonal help.

‡ Fresh weight.

Footnotes continued on next page.

Footnotes continued.

[§] Dry-yard labor, other than cutting, estimated to be as follows:

Apples -- 13 man-days per dry ton.
Pears -- 26.5 man-hours per fresh ton.
Prunes -- 8.3 man-hours per fresh ton, by sun.
6.0 man-hours per fresh ton, by dehydrator.

[¶] Green weight.

[‖] Dry-weight 200 pounds to bale.

TABLE 4

Summary of Seasonal Labor Needs by Months
Sonoma County
1935

Month	Required man-days of seasonal labor	Available work days	Required man-months of seasonal labor
January	27,664	15	1,845
February	31,018	18	1,724
March	9,353	21	446
April	17,596	21	838
May	37,778	22	1,718
June	49,607	25	1,985
July	46,716	26	1,797
August	135,840	26	5,225
September	184,522	26	7,097
October	49,566	23	2,156
November	10,440	21	498
December	22,181	15	1,479
Total	622,281	--	26,808

Notes

Notes on Table 2.-- Data concerning "time of need" as shown in this table break down required seasonal labor into the period when the work is performed in order to permit a subsequent determination of labor needs by months (table 3). Some operations are performed only to a limited extent by seasonal workers. For instance, only about 60 per cent of the pruning of apples is estimated to have been done by seasonal workers. This having been done in three different months, a portion was assigned to each month shown.

The amount of work done each month is based on the cropping system followed during 1935. The allotting of amounts of work is based on findings concerning local farm practices and required time to "make" a crop, resulting from inquiry of producers and records of shipments, the latter proving helpful in fixing dates of planting and subsequent tasks involved in producing a given crop. Proportionate amounts of output harvested each month were determined from data of local practices with respect to harvesting, and from carlot shipments of perishable products. In some cases, records of unloads of truck shipments at San Francisco from the "local" district were used.

Notes on Table 3.-- Table 3 is the condensed summary of labor needs as worked out for Sonoma County, as a result of findings pertinent to 1935. The data are presented by months with the tasks which were performed in each month indicated by both crop and task. The size of the job was calculated in table 1 (acreage and production) and table 2 (task, time of performance, and percentage of work pertinent to a given month). The output per man-day was calculated as indicated in the forword presenting table 3. The number of required man-days is a result of dividing the size of the task by output per man-day. The available days for the different tasks involve two variables. The first is the number of days when field work is possible because of favorable weather conditions. The basis for this column was determined from a study of the monthly weather charts of the United States Weather Bureau for the years 1933, 1934, and 1935. These data indicated available days per month as follows (based on a 26-day working month allowance for holidays):

Month	Available days	Length of work day	Month	Available days	Length of work day
		hours			hours
January	15	9	July	26	10
February	18	9	August	26	10
March	18	10	September	26	10
April	21	10	October	23	10
May	22	10	November	21	9
June	25	10	December	15	9

Source of data: Based on precipitation records of the Santa Rosa station of the United States Weather Bureau for the years 1933, 1934, and 1935.

The second factor influencing the number of available days was the size of the job. If the output was only a few cars, then the number of days was limited to the time needed to get out these cars efficiently. If a field operation had to be performed in a period less than the number of available days in the month, then the specific number of days was noted. For example, in August, the cutting and piling of radish for seed was limited to the first fifteen days of the month.

The totals of table 3 show the total required man-days of needed seasonal labor, the available days for field work during the month, and the necessary number of men (as defined in the opening paragraph of table 3) required on a monthly basis to care for the tasks ordinarily performed by seasonal workers.

In an area such as Sonoma County, involving a variety of annual crops, the findings as set forth in this report are bound to fluctuate materially from year to year, because of the market outlook upon what and how much acreage is planted, and when it is planted; because of variable seasonal conditions affecting yields, time of performing operations, and available days; and because of harvesting operations on certain crops being speeded up to supply a good market, or retarded to avoid a poor one, resulting in marked variations in the need for harvest labor.